```
Last login: Mon Mar  8 01:48:08 on ttys002

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
yanans-MacBook-Pro-2:~ xieyanan$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.23 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database lianxi03 character set utf8;
Query OK, 1 row affected, 1 warning (0.00 sec)

mysql> use lianxi03;
Database changed
mysql> #学生表
mysql> CREATE TABLE student(
    -> id INT PRIMARY KEY AUTO_INCREMENT,
    -> NAME VARCHAR(20), -- 姓名
    -> city VARCHAR(10), -- 城市
    -> age INT -- 年龄
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql>
mysql> #老师表
mysql> CREATE TABLE teacher(
    -> id INT PRIMARY KEY AUTO_INCREMENT,
    -> NAME VARCHAR(20) -- 姓名
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql>
mysql> #课程表
mysql> CREATE TABLE course(
    -> id INT PRIMARY KEY AUTO_INCREMENT,
    -> NAME VARCHAR(20), -- 课程名
    -> teacher_id INT,  -- 外键 对应老师表 主键id
    -> FOREIGN KEY (teacher_id) REFERENCES teacher(id)
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql>
mysql> #学生与课程中间表
mysql> CREATE TABLE student_course(
    -> student_id INT, -- 外键 对应学生表主键
    -> course_id INT, -- 外键 对应课程表主键
    -> score INT,-- 某学员 某科的 考试分数
    -> FOREIGN KEY (student_id) REFERENCES student(id),
    -> FOREIGN KEY (course_id) REFERENCES course(id)
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql>
mysql> INSERT INTO teacher VALUES(NULL,'关羽');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO teacher VALUES(NULL,'张飞');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO teacher VALUES(NULL,'赵云');
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> INSERT INTO student VALUES(NULL,'小王','北京',20);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小李','上海',18);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小周','北京',22);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小刘','北京',21);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小张','上海',22);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小赵','北京',17);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小蒋','上海',23);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小韩','北京',25);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小魏','上海',25);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student VALUES(NULL,'小明','北京',20);
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> INSERT INTO course VALUES(NULL,'语文',1);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO course VALUES(NULL,'数学',1);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO course VALUES(NULL,'生物',2);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO course VALUES(NULL,'化学',2);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO course VALUES(NULL,'物理',2);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO course VALUES(NULL,'英语',3);
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> INSERT INTO student_course VALUES(1,1,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(1,2,90);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO student_course VALUES(1,3,85);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(1,4,78);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(2,2,53);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(2,3,77);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(2,5,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(3,1,71);
Query OK, 1 row affected (0.00 sec)
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mysql> INSERT INTO student_course VALUES(3,2,70);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(3,4,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(3,5,65);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(3,6,75);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO student_course VALUES(4,2,90);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(4,3,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(4,4,70);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(4,6,95);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(5,1,60);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(5,2,70);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(5,5,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(5,6,69);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(6,1,76);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(6,2,88);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(6,3,87);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(7,4,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(8,2,71);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(8,3,58);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO student_course VALUES(8,5,68);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(9,2,88);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(10,1,77);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(10,2,76);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(10,3,80);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(10,4,85);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO student_course VALUES(10,5,83);
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> #第一题
mysql> -- 1、查询平均成绩大于70分的同学的学号,姓名,和平均成绩
mysql> -- 1.1 分组查询每个学生的 学号,姓名,平均分
mysql> -- 1.2 增加条件：平均成绩大于70
mysql> select s.id as '学号', s.name as '姓名', avg(sc.score) as '平均成绩'
    -> from student s
    -> left join student_course sc
    -> on s.id = sc.student_id
    -> group by s.id
    -> having avg(sc.score) > 70;
+--------+--------+--------------+
| 学号   | 姓名   | 平均成绩     |
+--------+--------+--------------+
|      1 | 小王   |      83.2500 |
|      3 | 小周   |      72.2000 |
|      4 | 小刘   |      83.7500 |
|      6 | 小赵   |      83.6667 |
|      7 | 小蒋   |      80.0000 |
|      9 | 小魏   |      88.0000 |
|     10 | 小明   |      80.2000 |
+--------+--------+--------------+
7 rows in set (0.01 sec)

mysql>
mysql> #第二题
mysql> -- 2. 查询所有同学的学号、姓名、选课数、总成绩
mysql> -- 2.1 需要查询两张表 student表和 student_course表
mysql> -- 2.2 需要使用 student_id 学号字段,进行分组
mysql> -- 2.3 需要使用到 count函数 sum函数
mysql> select s.id as '学号', s.name as '姓名',count(sc.course_id) as '选课数', sum(sc.score) as '总成绩'
    -> from student s
    -> left join student_course sc
    -> on s.id = sc.student_id
    -> group by s.id;
+--------+--------+----------+----------+
| 学号   | 姓名   | 选课数   | 总成绩   |
+--------+--------+----------+----------+
|      1 | 小王   |        4 |      333 |
|      2 | 小李   |        3 |      210 |
|      3 | 小周   |        5 |      361 |
|      4 | 小刘   |        4 |      335 |
|      5 | 小张   |        4 |      279 |
|      6 | 小赵   |        3 |      251 |
|      7 | 小蒋   |        1 |       80 |
|      8 | 小韩   |        3 |      197 |
|      9 | 小魏   |        1 |       88 |
|     10 | 小明   |        5 |      401 |
+--------+--------+----------+----------+
10 rows in set (0.00 sec)

mysql> #第三题
mysql> -- 3. 查询学过赵云老师课程的同学的学号、姓名
mysql> -- 3.1 查询赵云老师的id
mysql> -- 3.2 根据老师ID,在课程表中查询所教的课程编号
mysql> -- 3.3 将上面的子查询作为 where 后面的条件
mysql>
mysql> select s.id as '学号', s.name as '姓名'
    -> from student_course as sc
    -> left join student as s
    -> on sc.student_id = s.id
    -> where sc.course_id in (
    ->   select c.id
    ->   from teacher as t
    ->   left join course as c
    ->   on t.id = c.teacher_id
    ->   where t.name = '赵云'
    -> );
+--------+--------+
| 学号   | 姓名   |
+--------+--------+
|      3 | 小周   |
```

```
|      4 | 小刘    |
|      5 | 小张    |
+--------+--------+
3 rows in set (0.00 sec)

mysql> select c.*, t.*
    ->   from teacher as t
    ->   left join course as c
    ->   on t.id = c.teacher_id
    ->   where t.name = '赵云';
+------+-------+------------+----+--------+
| id   | NAME  | teacher_id | id | NAME   |
+------+-------+------------+----+--------+
|    6 | 英语  |          3 |  3 | 赵云   |
+------+-------+------------+----+--------+
1 row in set (0.00 sec)

mysql> select s.*, sc.*
    -> from student_course as sc
    -> left join student as s
    -> on sc.student_id = s.id;
+------+--------+-------+------+------------+-----------+-------+
| id   | NAME   | city  | age  | student_id | course_id | score |
+------+--------+-------+------+------------+-----------+-------+
|    1 | 小王   | 北京  |   20 |          1 |         1 |    80 |
|    1 | 小王   | 北京  |   20 |          1 |         2 |    90 |
|    1 | 小王   | 北京  |   20 |          1 |         3 |    85 |
|    1 | 小王   | 北京  |   20 |          1 |         4 |    78 |
|    2 | 小李   | 上海  |   18 |          2 |         2 |    53 |
|    2 | 小李   | 上海  |   18 |          2 |         3 |    77 |
|    2 | 小李   | 上海  |   18 |          2 |         5 |    80 |
|    3 | 小周   | 北京  |   22 |          3 |         1 |    71 |
|    3 | 小周   | 北京  |   22 |          3 |         2 |    70 |
|    3 | 小周   | 北京  |   22 |          3 |         4 |    80 |
|    3 | 小周   | 北京  |   22 |          3 |         5 |    65 |
|    3 | 小周   | 北京  |   22 |          3 |         6 |    75 |
|    4 | 小刘   | 北京  |   21 |          4 |         2 |    90 |
|    4 | 小刘   | 北京  |   21 |          4 |         3 |    80 |
|    4 | 小刘   | 北京  |   21 |          4 |         4 |    70 |
|    4 | 小刘   | 北京  |   21 |          4 |         6 |    95 |
|    5 | 小张   | 上海  |   22 |          5 |         1 |    60 |
|    5 | 小张   | 上海  |   22 |          5 |         2 |    70 |
|    5 | 小张   | 上海  |   22 |          5 |         5 |    80 |
|    5 | 小张   | 上海  |   22 |          5 |         6 |    69 |
|    6 | 小赵   | 北京  |   17 |          6 |         1 |    76 |
|    6 | 小赵   | 北京  |   17 |          6 |         2 |    88 |
|    6 | 小赵   | 北京  |   17 |          6 |         3 |    87 |
|    7 | 小蒋   | 上海  |   23 |          7 |         4 |    80 |
|    8 | 小韩   | 北京  |   25 |          8 |         2 |    71 |
|    8 | 小韩   | 北京  |   25 |          8 |         3 |    58 |
|    8 | 小韩   | 北京  |   25 |          8 |         5 |    68 |
|    9 | 小魏   | 上海  |   25 |          9 |         2 |    88 |
|   10 | 小明   | 北京  |   20 |         10 |         1 |    77 |
|   10 | 小明   | 北京  |   20 |         10 |         2 |    76 |
|   10 | 小明   | 北京  |   20 |         10 |         3 |    80 |
|   10 | 小明   | 北京  |   20 |         10 |         4 |    85 |
|   10 | 小明   | 北京  |   20 |         10 |         5 |    83 |
+------+--------+-------+------+------------+-----------+-------+
33 rows in set (0.00 sec)

mysql> -- 4. 查询选课 少于三门学科的学员
mysql> -- 4.1 查询每个学生学了几门课 条件1: 小于等于三门
mysql> -- 4.2 查询 学号和姓名， 将4.1 作为临时表
mysql> create view student_enrolment_count as
    -> select sc.student_id, count(sc.course_id) as enrolment_count
    -> from student_course as sc
    -> group by sc.student_id
    -> having count(sc.course_id) <= 3;
Query OK, 0 rows affected (0.01 sec)

mysql> select s.name
    -> from student as s
    -> where s.id in (
    ->   select student_id
    ->   from student_enrolment_count
    -> );
+--------+
| name   |
+--------+
| 小李   |
| 小赵   |
| 小蒋   |
| 小韩   |
| 小魏   |
+--------+
5 rows in set (0.00 sec)

mysql>
mysql> -- alternative
mysql> select s.name
    -> from student_enrolment_count as sec
    -> left join student as s
    -> on s.id = sec.student_id;
+--------+
| name   |
+--------+
| 小李   |
| 小赵   |
| 小蒋   |
| 小韩   |
| 小魏   |
+--------+
5 rows in set (0.00 sec)

mysql> select * from student_enrolment_count;
+------------+-----------------+
| student_id | enrolment_count |
+------------+-----------------+
|          2 |               3 |
|          6 |               3 |
|          7 |               1 |
|          8 |               3 |
|          9 |               1 |
+------------+-----------------+
5 rows in set (0.00 sec)

mysql> select sc.student_id, sc.name count(sc.course_id) as enrolment_count
    -> from student_course as sc
    -> group by sc.student_id;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'count(sc.course_id) as enrolment_count
from student_course as sc
group by sc.stu' at line 1
mysql> select sc.student_id, sc.name, count(sc.course_id) as enrolment_count
    -> from student_course as sc
    -> group by sc.student_id;
ERROR 1054 (42S22): Unknown column 'sc.name' in 'field list'
mysql> select sc.student_id, count(sc.course_id) as enrolment_count
    -> from student_course as sc
    -> group by sc.student_id;
+------------+-----------------+
| student_id | enrolment_count |
+------------+-----------------+
|          1 |               4 |
|          2 |               3 |
|          3 |               5 |
|          4 |               4 |
|          5 |               4 |
|          6 |               3 |
|          7 |               1 |
|          8 |               3 |
|          9 |               1 |
|         10 |               5 |
+------------+-----------------+
10 rows in set (0.00 sec)

mysql>
```